

**WHAT IS CLAIMED IS:**

1. A deep rolling tool comprising:
  - a housing having first and second members;
  - a shaft fixed relative to said housing and extending between said first and said second members;
  - a roller rotatable about said shaft and supported thereon;
  - at least one work roll rotatably supported by said roller;
  - said first and said second members rotate relative to one another between a first position at which said members are substantially aligned and locked, and a second position at which said members are separable.
2. The deep rolling tool of claim 1 comprising a detent member mounted in one of said members and extendable into the other of said members to lock said members together at said first position.
3. The deep rolling tool of claim 1 comprising:
  - a plurality of elongate members extending from one of said housing members;
  - and
  - a plurality of slots in the other of said housing members, each of said slots corresponding to and receiving one of said elongate members;
  - whereupon twisting said first and said second housing members between said first and said second positions will allow each elongate member to traverse the corresponding slot, said elongate members locking said housing members together at said first position.

4. The deep rolling tool of claim 3 wherein each of said elongate members comprises an enlarged head; and

each of said slots includes a substantially circular end portion larger than and corresponding to the enlarged head of the corresponding elongate member.

5. The deep rolling tool of claim 3 wherein each of said elongate members is threadedly received in said one of said housing members.

6. The deep rolling tool of claim 3 wherein a relative radial displacement between said first and said second housing members at said second position is approximately 13°.

7. The deep rolling tool of claim 4 comprising ramping surfaces formed along edges of each of said slots and defining an inclining surface along a length thereof, said enlarged heads engaging said ramping surfaces.

8. The deep rolling tool of claim 1 comprising a substantially rectangular recess extending along an edge of at least one of said first and second housing members; and

first and second substantially mirror image cage portions mounted in said recess, said cage portions retaining said at least one work roll.

9. The deep rolling tool of claim 8 wherein said first and second cage portions are adjustable in said recess.

10. A tool for deep rolling an elongate work piece comprising:
- a tool housing;
  - a shaft extending in said housing;
  - a back up roller arranged about said shaft and rotatably supported thereon; and
  - a two piece work roll cage mounted to said housing and retaining a work roll rotatable against said back up roller.
11. A tool according to claim 10 wherein said cage is positioned in a substantially rectangular recess.
12. A tool according to claim 11 comprising first and second tabs extending from opposite ends of said recess.
13. A tool according to claim 12 wherein said cage comprises first and second cage portions in said recess, each said cage portion having an aperture for receipt of a fastener for securing said cage at a selected position in said recess.
14. An apparatus for deep rolling a workpiece comprising:
- an upper tool having at least one rolling member engageable against the workpiece;
  - a lower tool having at least one rolling member engageable against the workpiece;

at least one of said upper and lower tools includes first and second housing members twistable relative to one another between a first radial position at which said members are locked together and a second radial position at which said members are separable.

15. The apparatus of claim 14 wherein:

at least one of said first and second housing members includes a plurality of elongate members; and

the other of said housing members includes a plurality of slots corresponding to and receiving said elongate members.

16. The apparatus of claim 14 wherein said upper tool includes first and second housing members.

17. The apparatus of claim 14 wherein said lower tool includes first and second housing members.

18. The apparatus of claim 14 wherein at least one of said first and second housing members defines a recess having a cage member positioned therein, said recess communicating with a bore having a fastener positioned therein for securing the cage in said recess.

19. The apparatus of claim 14 wherein said first and second housing members each include a flange extending outwardly from and longitudinally along peripheral edges thereof, said flanges substantially aligned at said first position; and

first and second cages are secured against said flanges.

20. The apparatus of claim 14 wherein at least one of said first and second housing members comprises a pocket for receipt of said back up roller, said pocket extending radially in said housing member substantially 360°.